

Grand Avenue Bridge
Spanning O'Neill Creek at Grand Avenue
Neillsville
Clark County
Wisconsin

HAER No. WI-72

HAER
WIS
10-NEIL,
2-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
Denver, Colorado 80225-0287

HISTORIC AMERICAN ENGINEERING RECORD
GRAND AVENUE BRIDGE
HAER No. WI-72

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2 -

Location: Spanning O'Neill Creek at Grand Avenue in Neillsville, Clark County, Wisconsin.

UTM: 15:690740:4937025

Quad: Neillsville, Wisconsin (7.5 minute series)

Date of Construction: 1894

Present Owner: None

Present Use: Demolished in 1985. Decorative portals were salvaged and reerected in 1987 at either end of a footbridge over Snake Creek in Schuster Park, Neillsville, Wisconsin.

Significance: One of few ornately decorated iron truss Pratt bridge ever erected in Wisconsin. It was built by the Wisconsin Bridge and Iron Co., one of the leading nineteenth century bridge-building firms.

Project Information: Documentation of the Grand Avenue Bridge was begun in 1985 by Ingolf Vogeler, Department of Geography, University of Wisconsin-Eau Claire. Robert S. Newbery, Wisconsin Department of Transportation Staff Historian, and Amy A. Ross, Architectural Historian at Mead & Hunt, Inc., completed the report in 1994.

History of Clark County

Clark County, located in west-central Wisconsin, was settled in the middle of the nineteenth century. The county is in the Mississippi Valley and is drained by three of the river systems of that waterway: the Black River; the Eau Claire River, a tributary of the Chippewa system; and the Yellow and Eau Pleine rivers of the Wisconsin system.¹ These geographical advantages, along with its wealth of timber and animals, attracted the first explorers.

James O'Neill, the first white settler in Clark County and the founder of Neillsville, was a "rough-and-ready" pioneer lumberman and sawmill operator from Lisbon, New York. Arriving in 1845 with two other men, O'Neill built a cabin on a creek adjacent to the Black River. They then began to construct a sawmill. Though settlement was slow, enough settlers had arrived in Neillsville by 1854 to justify naming the community the county seat and platting the town the following year.²

Clark County was well suited to the timber industry. It was generally covered by the Northern Mesic Forest, which included maple, hemlock, and yellow birch trees, as well as heavy concentrations of white and red pine along its south and west borders.³ All of the settlers who came during the early period were associated with this industry and were attracted to the area by its vast stands of timber.

From the 1840s to the 1870s, logging and lumbering were the principal industries of the Clark County and the town of Neillsville. Lumber and logs were identified as the community's

¹ History of Clark County, Wisconsin, comp. by Franklyn Curtiss-Wedge (Chicago and Winona, Ill.: H.C. Cooper & Co., 1918) 17.

² Neillsville--100 Years as a City (Neillsville, Wisc.: Clark County Press, 1982); History of Northern Wisconsin (Chicago: Western Historical Company, 1881) 228-29, 231, 234, 235. When the county was organized in 1854, it contained only about twenty-five homesteads; see History of Clark County 35-60.

³ Early Vegetation of Wisconsin (Madison, Wisc.: UW-Extension, Geological and Natural History Survey, 1965) map.

primary exports in 1879, a year in which its population reached 1,500.⁴ Neillsville was incorporated as a city in 1882, and had a population of 1,936 by this time. By the 1890s, most of the white pine had been cut and lumbermen had turned to harvesting the hardwoods. Lumber supplies were clearly dwindling and, by 1900, the reserve of timber had been exhausted.⁵

As the lumbermen pulled out, leaving a vast cut-over region, aspiring agriculturists moved in. The already-cleared land and rich soil attracted farmers to the region. The number of farms in the county grew rapidly, as did the number of acres in cultivation. In 1870, there were 357 farms with 55,914 acres planted; in 1890, there were 2,474 farms and 185,697 cultivated acres; and, by 1910, 3,549 farms utilized 411,825 acres.⁶ Neillsville's gradual evolution from a lumber-oriented town to one that focused more on agriculture was evident by 1886 when its principal shipments were lumber, staves, heading, and livestock. The transition continued and, in 1891, the town was described as the "receiving and distributing point for the large lumber and agricultural district tributary...".⁷

By the early twentieth century, processing of agricultural products, particularly milk, had become Neillsville's principal industry. Clark County evolved into one of the leading dairy producing counties in the state.⁸ The American Stores Dairy Company had a milk evaporation plant in Neillsville and supplied 2,500 retail outlets on the East Coast. By 1914, the city had two canning companies, which at their peak canned 80,000 cases of peas from 1,342 acres. The city's brewery, which operated from 1869-1925, proved to be an enduring business.⁹

The Bridge's Role in the City's Transportation History

Despite the street's pretentious name, Grand Avenue seems to have achieved significance only as a secondary route. Then, as today, Grand Avenue was located away from the heart of the city's business district (Fig. 1). The 1894 Grand Avenue Bridge spanning O'Neill Creek was the second bridge at this site. Industrial land uses prevailed to the south of the bridge, while

⁴ Northern Wisconsin 228-29.

⁵ Northern Wisconsin 227.

⁶ Northern Wisconsin 228; A Century of Wisconsin Agriculture, 1848-1948 (Madison, Wisc.: Wisconsin Crop and Livestock Reporting Service, 1948) 87.

⁷ Wisconsin State Gazetteer and Business Directory, 1891-1892 (Chicago: R.L. Polk & Co., 1891) 770.

⁸ A Century of Wisconsin Agriculture 74.

⁹ Neillsville--100 Years as a City 35; Clark County Centennial, Inc., The Book of the Years (Neillsville, Wisc.: Clark County Press, 1953) 6-36.

residential areas lay to the north. Historically, the crossing was one of two that gave access to the area north of O'Neill Creek; the other being the bridge at Hewett Street, two blocks east of Grand Avenue and the main artery of Neillsville. Though Hewett Street was the more significant route, the city apparently took pride in both crossings. Both the Grand Avenue Bridge and the Hewett Street Bridge were substantial and ornate structures, which was unusual for truss bridges.

Hewett Street was the main north-south thoroughfare, running through the heart of the business district. The first Hewett Street Bridge was built before 1874 and was wood. After the city paid \$200 in damages to a farmer whose wagon fell through the bridge, a new 110-foot span iron truss bridge was erected in the fall of 1892. The Hewett Street Bridge was described as "a handsome structure, indeed, with a strong overhead super structure much like the Grand Avenue bridge."¹⁰ On 17 September 1939, under the weight of a milk truck, the Hewett Street Bridge collapsed again. A new, concrete bridge was completed in June 1940.¹¹

Local historical materials provide little additional information on the bridges in Neillsville.¹² For example, the History of Clark County, Wisconsin provides only one reference to bridges, stating that "The bridges have been built at various dates as necessity has required."¹³

Construction of the Bridge

On 14 April 1894, the city of Neillsville passed City Ordinance No. 161. In the first section of the ordinance, the Grand Avenue Bridge was described as "completely given out and is absolutely unsound and unsafe for travel." Two corporate bonds, bearing an interest rate of five percent per year, were issued by the city for a total of \$3,000.¹⁴ The 1892 Sanborn map shows the wood bridge that was to be replaced (Fig. 2).

¹⁰ Neillsville--100 Years as a City 43.

¹¹ "Hewett Street Bridge Buckles Under Weight of Truck Sunday," Clark County Press 21 September 1939; "Opened," Clark County Press 20 June 1940. The 1940 bridge was replaced in 1990; see Wisconsin Department of Transportation, bridge files, B-10-683.

¹² History of Clark County; Clark County, the Garden of Wisconsin (Neillsville, Wisc.: Satterlee and Tift, Printers, 1890); and A Glimpse of Neillsville, Wisconsin (N.p.: n.d).

¹³ History of Clark County, Wisconsin 631.

¹⁴ Ordinances, City of Neillsville, Vol. 1, 252.

The Neillsville Times of 1894 provides some insight into the city's building activities in that year.¹⁵ Although 1894 "will be famous in history for its hard times ... it is little short of marvelous what a showing Neillsville has to report in growth for the 1894 building season."¹⁶ Commercial buildings valued at \$22,600 and bridge, water, and sewer extensions valued at \$4,340 were constructed. The Grand Avenue Bridge, which cost \$3,000, accounted for a significant portion of the expenditure on civic improvements.¹⁷

On 30 June 1894, The Neillsville Times reported that "the abutments for the bridge were let to Wm. Campbell, he being the lowest bidder."¹⁸ The 1897 Sanborn map shows the new "iron bridge" across O'Neill Creek (Fig. 3).

Engineering Description

The Grand Avenue Bridge was a 90-foot single-span Pratt overhead truss bridge with a 16-foot roadway. The vertical clearance was 19'-9". Each truss consisted of five panels. Truss members were probably wrought iron.¹⁹

In the 1940s or 1950s, the original timber deck was replaced with a 6-inch concrete floor. Over the years, the deck had also accumulated a two-inch bituminous mat that was estimated to weigh 45 tons. The mat was removed in 1961 and exposed a fairly solid floor with few cracks. The deck was supported by 9" x 4-1/2" steel eye-beams spaced at 18-foot centers. The deck rested directly on the floor beams which in turn were attached to the bottom chords. There was a 7-foot sidewalk on the east side, which retained its wood deck.

The truss was supported by stone masonry abutments. Two corrugated metal pipes filled with concrete were added to provide support at the second panel point from the south. The floor

¹⁵ Unfortunately the City Council minutes for 1890-1899 (Vol. 2) no longer exist. Earlier and later records are located in the basement of the Neillsville City Hall.

¹⁶ The Neillsville Times, 22 November 1894.

¹⁷ The Neillsville Times, 22 November 1894.

¹⁸ The Neillsville Times, 5 July 1894.

¹⁹ Two of the pre-1895 Pratt overhead truss bridges identified in the 1981 Wisconsin Department of Transportation bridge survey were tested by a metallurgist and were found to be wrought iron. It is presumed that the other five known bridges built before 1895 were also wrought iron since steel did not come into general popularity until after 1895. See Barbara Wyatt and Harold Meyer, "Grand Avenue Bridge," National Register of Historic Places Nomination Form (State Historical Society of Wisconsin, 23 August 1984).

beam rested on these pipes.²⁰ However, a 1962 bridge inspection concluded that these supports were not of any value and were possibly harmful as they changed the entire character of the truss.²¹

Typical of the pre-1895 Pratt overhead trusses erected in Wisconsin, components of the Grand Avenue Bridge appeared light and slender. Compression members were built-up sections of plates and angles riveted together, and tension members were both round and rectangular bars. Floor beams were also built-up riveted sections with plates for the web and angles for the flanges. Joints were pin-connected.

The bridge was decorated with cresting and finials over each portal. The words "Grand Avenue" were punched into the portal struts at either end of the bridge. A delicate rail with curved and angular members spanned both sides of the bridge.²² On the southwest post, a plaque read: "1894, Builders, Wisconsin Bridge & Iron Co, North Milwaukee, Wis." This plaque and the four decorative finials were salvaged from the bridge by the Historical and Preservation Endowment of Neillsville (HAPEN) and are now displayed in Clark County's 1897 Jail Museum. HAPEN was also instrumental in saving the decorative portals and having them reerected at either end of the footbridge over Snake Creek in Schuster Park.²³

Important comparisons can be made between the Grand Avenue Bridge and the 1892 Hewett Street Bridge, also built by Wisconsin Bridge & Iron and known through a historical photograph (Fig. 4) and surviving, original bridge plans.²⁴ The Hewett Street Bridge seems to have been quite similar in design to the Grand Avenue Bridge, except that the latter's members were

²⁰ After the collapse of more heavily travelled Hewett Street bridge in 1939, the Grand Avenue Bridge was propped up to permit heavier traffic to cross here while a new bridge was erected; see "Hewett Street Bridge Buckles Under Weight of Truck Sunday." These columns may survive from this attempt to bolster the bridge.

²¹ State Highway Commission of Wisconsin, "Structures Condition Survey," 29 March 1962 (Wisconsin Department of Transportation, Staff Historian's files); Preliminary Bridge Design Engineer, letter to D.E. Gordon, 3 April 1962 (Wisconsin Department of Transportation, Staff Historian's files).

²² Robert Newbery and H. W. Guy Meyer, "Ordinary Iron Highway Bridges," Wisconsin Academy Review 30.2(1984): 34-37. Also see Wyatt and Meyer.

²³ Theo Jonkel, letter to Robert S. Newbery, 11 May 1987; "Dedication Sat. for "bridge" in Schuster Park," Clark County Press, 11 June 1987.

²⁴ One historical photograph of the 1892 Hewett Street Bridge was found, but none seem to exist for the Grand Avenue Bridge; see Neillsville--100 Years as a City.

somewhat heavier. It even had the words "Hewett Street" punched in the portal struts. Decorative ironwork on the top of the two end beams and on top of the four posts at both ends of the bridge was identical to that of the Grand Avenue Bridge.

History of Pratt Trusses in Wisconsin

The Pratt truss was one of the two predominant truss types constructed in Wisconsin, as well as in the United States, in the late nineteenth century.²⁵ The Pratt truss was patented by Thomas and Caleb Pratt in 1844, but did not gain popularity in the United States until late in the nineteenth century. The range of span lengths for a Pratt overhead truss is 60 to 160 feet; in Wisconsin, they are generally from 90 to 110 feet in length.

Early and late Pratt overhead trusses are distinguishable through some visually obvious differences. In pre-1895 Pratts, the beams are built up from plates and angles, and the outside bottom corners of the floor beams are sometimes clipped. The deck is made of wood planks. The joints are pin-connected, and the tension members and the top lateral strut are bars or rods. The 1894 Grand Avenue Bridge exhibits the general characteristics of Pratt overhead trusses of this period.

From 1895 to 1910, the floor beams were rolled sections and the top lateral struts were deep and sometimes augmented by knee bracing. The hip verticals tended to be more substantial. Some bridges in this category used a more substantial bottom chord, such as channel beams; others continued to use rather light loop welded eye bars. The metal used in truss bridges built during this period was usually steel, whereas pre-1895 Pratt trusses were wrought-iron. Standardized bridge plans were adopted by the State Highway Commission (SHC) in 1914, and specified Pratt overhead trusses for longer spans.²⁶

Wisconsin Bridge and Iron Company

The founder of the Wisconsin Bridge and Iron Company was Frederick Weinhagen, who had studied engineering in Hanover, Germany, near his birthplace in Hildesheim. Weinhagen came to the United States after the Civil War at the age of 16. He settled in Milwaukee, and by 1886,

²⁵ The other was the Warren truss; see Newbery and Meyer 34-37.

²⁶ A few examples can be found which diverged from this standard.

he was an agent for the Penn Bridge Works, although he also built at least one bridge under his own name. By 1887, he had formed the Wisconsin Bridge and Iron Company.²⁷

He and his brother Berthold, a civil engineer, formed a joint proprietorship in 1888. The company was incorporated in January 1891. The two brothers ran the company until Berthold left the firm in 1900. Friederich remained actively involved with the company at least until 1910, when he became president of A. George Schultz Company, a Milwaukee box manufacturer.

The incorporation papers list Berthold Weinhausen, William Hinrich, and Herman A. Wagner. With capital stock of \$100,000, the company contracted and built bridges, as well as manufactured general ironwork. The company offices were in Milwaukee, while the plant was initially located in Wauwatosa, west of Milwaukee. By 1892, company officials agreed to build an extensive plant in the new suburb of North Milwaukee, to be erected by the spring of 1893. In addition to the main building, which measured 200'-0" x 300'-0", the plant included several smaller buildings, including offices, paint shops, and storerooms. The company spent \$45,000 on buildings and \$40,000 on machinery. The plant continued to operate at this location until 1929, when it moved to North 35th Street, Milwaukee.²⁸

In 1901, Wisconsin Bridge and Iron proudly advertised, "Not in any Trust," and the company apparently was able to compete with the American Bridge Company.²⁹ In 1904, the stockholders approved increasing the capital stock to \$300,000. Business continued to expand; six years later, company stock value increased to \$500,000. By 1936, the company was worth \$1,000,000. Wisconsin Bridge and Iron established two branch facilities in the state, located in Oxford and Antigo. The Oxford structures division manufactured farm building packages.³⁰

²⁷ George M. Danko, "A Selective Survey of Metal Truss Bridges in Wisconsin," ms., State Historical Society of Wisconsin-Historic Preservation Division (Madison, Wisc., 1977) 61. In 1886, Frederick Weinhausen was listed as a bridge builder in the Milwaukee City Directory. The 1887 Mill Road Bridge (P-36-22) in the Town of Manitowoc Rapids, Manitowoc County has a bridge plate listing Wisconsin Bridge and Iron Company as the builder.

²⁸ Milwaukee City Directory, 1869-1930 editions.

²⁹ Polk's Wisconsin State Gazetteer and Business Directory, 1901-1902 (Chicago: R.L. Polk & Co., 1901) 673.

³⁰ Wisconsin Bridge and Iron Company, "Articles of Incorporation and Amendments", in Office of Wisconsin Secretary of State, Corporation Division; Milwaukee Sentinel 24 April 1888; "Ready to Begin Work" Evening Wisconsin 24 September 1892; "New Leader at Steel Firm," newspaper clipping dated January 1973 in Wisconsin Bridge and Iron Company, Microfilm Clipping File, Milwaukee County Historical Society. This last article states that the company was 102 years old in 1973, but there is no evidence of the firm starting in 1870 or 1871.

Wisconsin Bridge and Iron built most of the bridges across the Milwaukee River in downtown Milwaukee and the 1895 lift bridge on 16th Street. They also built many truss bridges throughout the state, including the 1892 and 1894 bridges in Neillsville.³¹ The company ceased operations in 1983.

³¹ Kenneth Bjork, Saga in Steel and Concrete: Norwegian Engineers in America (Northfield, Minn.: Norwegian-American Historical Association, 1947) 157-158.

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Maps

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The Neillsville Times 22 November 1894.

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"Ready to Begin Work." Evening Wisconsin 24 September 1892.

Fig. 1

Official Zoning Map, City of Neillsville (City of Neillsville Zoning Ordinance. 23 March 1976. Eau Claire, Wisc.: West Central Wisconsin Regional Planning Commission, 1976.)

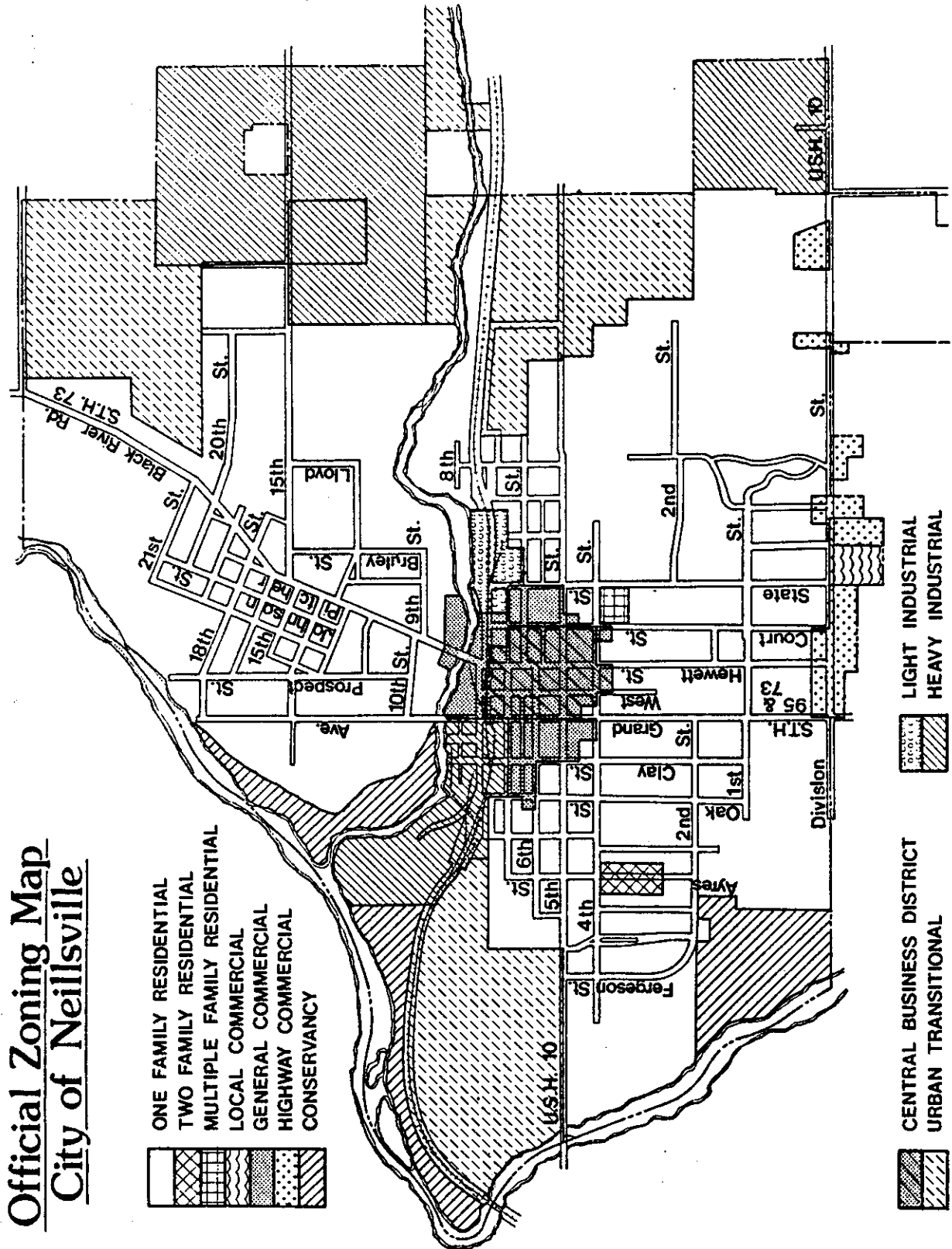


Fig. 2 1892 Sanborn Map of Neillsville, Wisconsin (Sanborn-Perris Map Company.
Neillsville, Wisconsin. New York and Chicago: Sanborn-Perris, 1892.)

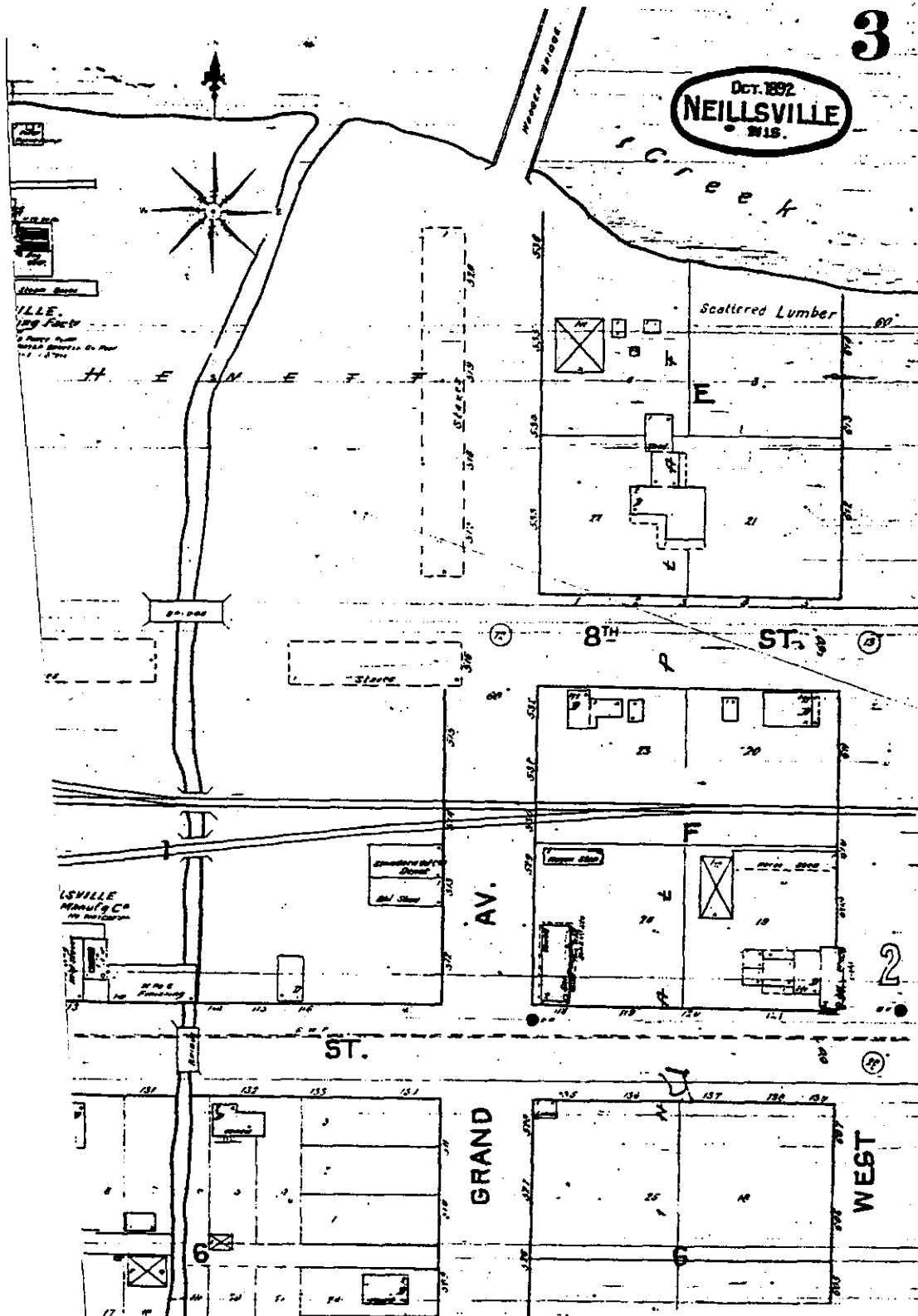


Fig. 3 1897 Sanborn Map of Neillsville, Wisconsin (Sanborn-Perris Map Company.
Neillsville, Wisconsin. New York and Chicago: Sanborn-Perris, 1897.)

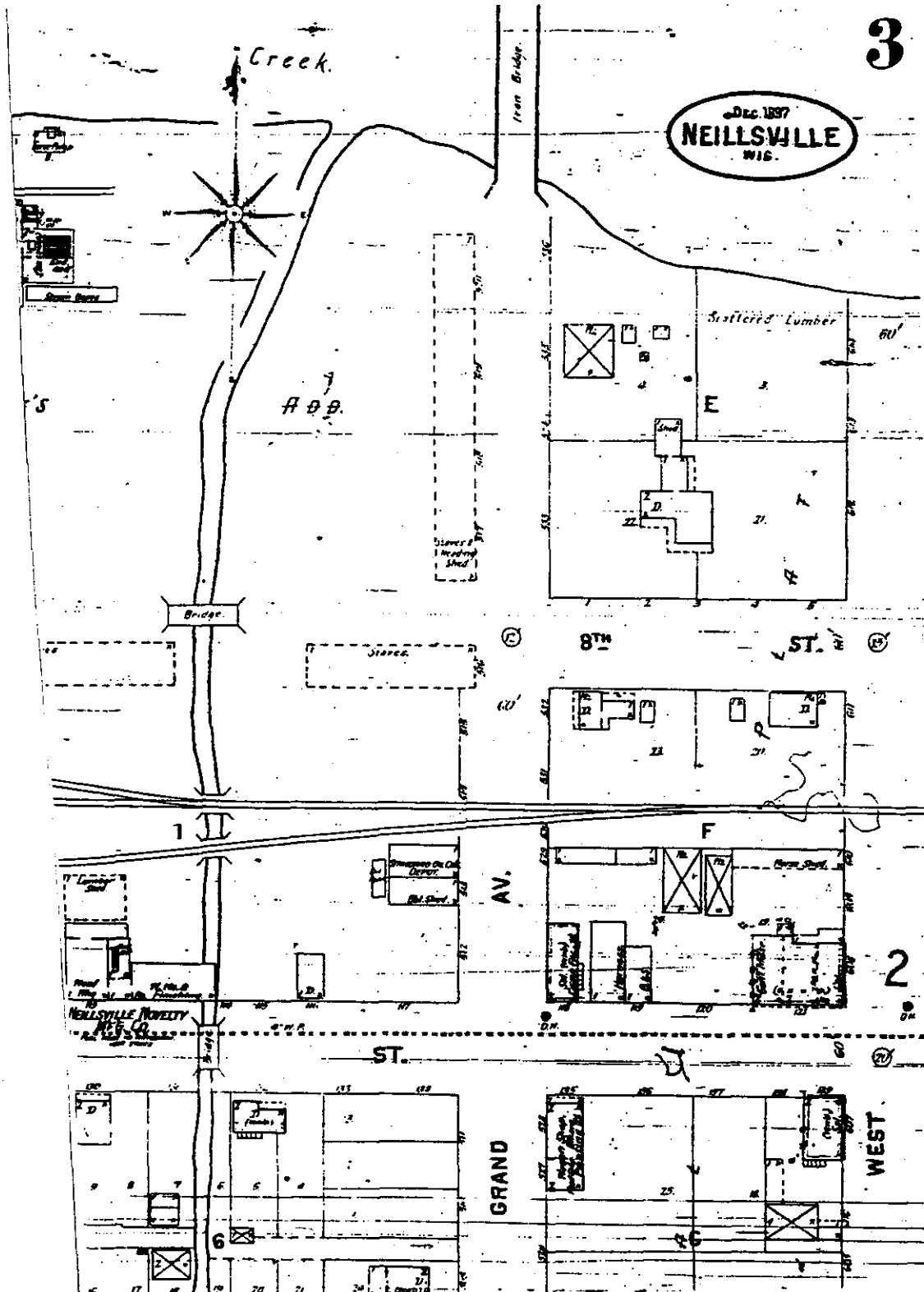


Fig. 4 1892 Hewett Street Bridge (Neillsville---100 Years as a City. Neillsville: Clark County Press, 1982.)

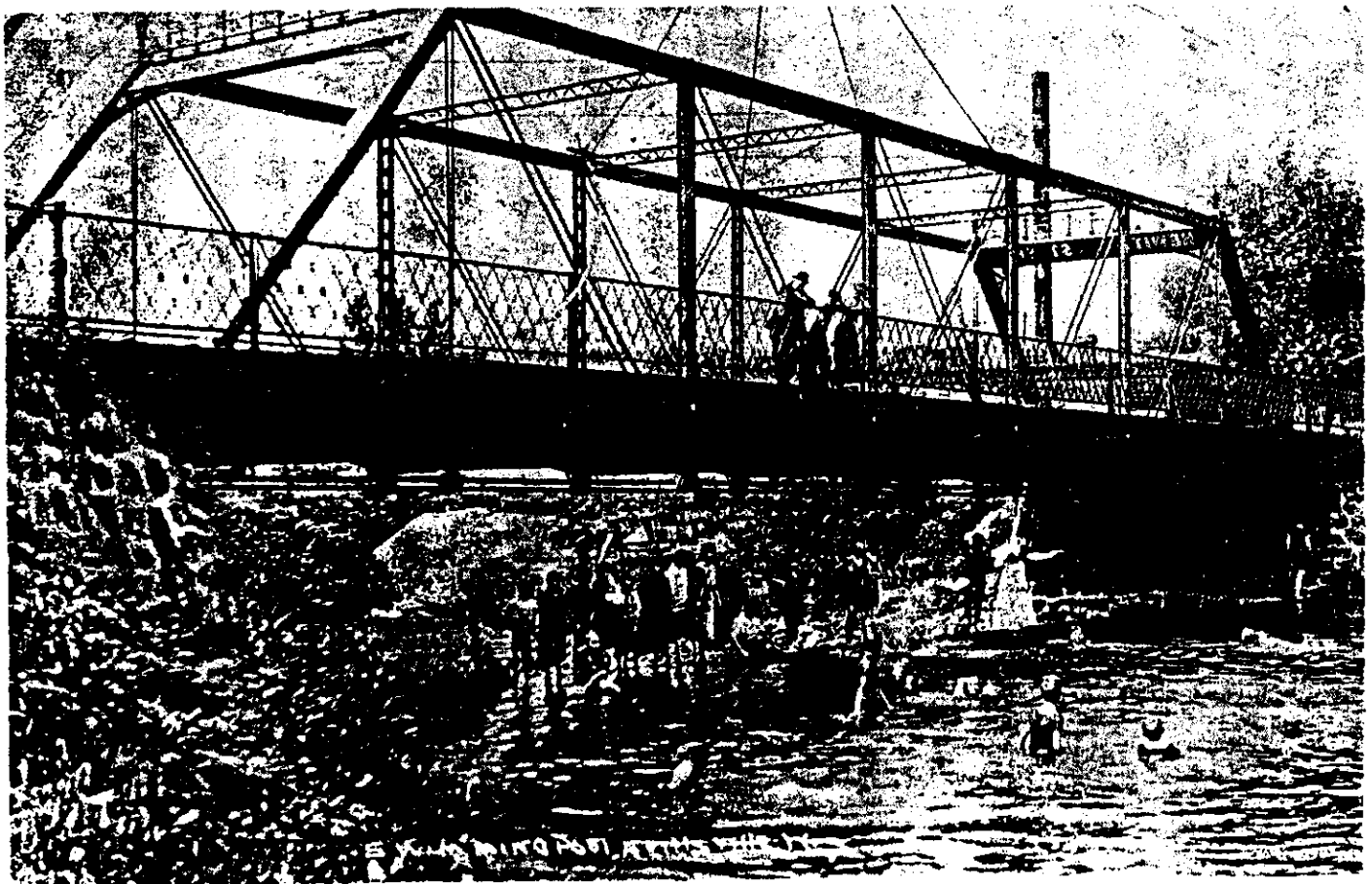


Fig. 5 USGS Quad: Neillsville, Wisconsin (7.5 minute series)
UTM: 15:690740:4937025

